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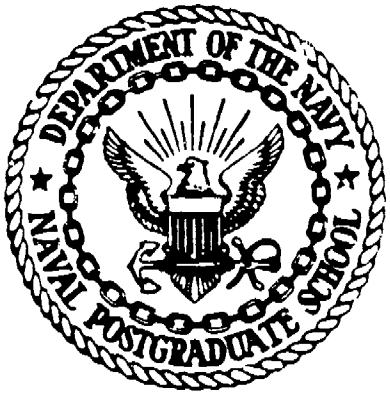




# THESIS

JOB MOBILITY AND WAGE GROWTH

by

Kim, In Hwan

June 1986

Thesis Advisor: Loren M. Solnick

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The purpose of this thesis is to investigate the effect of alternative job assignments and on wage growth within the firm. A multiple regression analysis is used to examine the influence of job changes and other factors on wage growth. The most highly rewarded type of job mobility is across departmental areas. Also, a performance rating variable significantly effects wage growth. The results indicated that certain mobility paths lead to advancement within the firm. A direction for future empirical analysis for career development is suggested.

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# JOB MOBILITY AND WAGE GROWTH

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Submitted in partial fulfillment of the
requirements for the degree of

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## ABSTRACT

The purpose of this thesis is to investigate the effect of alternative job assignments and on wage growth within the firm. A multiple regression analysis is used to examine the influence of job changes and other factors on wage growth. The most highly rewarded type of job mobility is across departmental areas. Also, a performance rating variable significantly effects wage growth. The results indicated that certain mobility paths lead to advancement within the firm. A direction for future empirical analysis for career development is suggested.

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# I. INTRODUCTION

In this thesis I will explore the effect of job reassignments on wage growth within the firm. Job reassignments represent a type of labor mobility which is expected to yield a return in the form of a more rapid increase in wages among otherwise similar employees. Labor mobility is one of the central topics of labor economics, and a long-standing subject of empirical research. Earlier labor mobility studies explored primarily the allocative effectiveness of the labor market. These studies analyzed attitudes, job change decisions, and the direction of observed labor mobility in an attempt to ascertain whether information, motivation, and behavior of workers were consistent with labor market theory[1] [Ref. 1: pp. 371-378].

In a comprehensive survey of the literature, Parnes(1970) concluded that the evidence on the operation of market forces[2] was mixed, both among different studies and even within them. Reviewing the more recent literature [Ref. 2: p. 34], Parsons(1978) finds promise in the

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[1]Human capital theory consistent with the wage increases will be discussed in chapter II.

[2]Readers who are interesting about this can get more information from Review of Industrial Relations Research, vol.1, 1970. p.34

emergence of human capital and search theories as tools for the analysis of labor mobility, labor turnover, and unemployment [Ref, 3: p. 27].

The purpose of this thesis is to investigate the effect of job assignments on changes in wage growth within the firm. Both "career path" and "human capital" theories are relevant to this study. This research is conducted using a sample of white, male, professional employees of a large U.S. manufacturing firm. Their job and salary histories are studied using multiple regression analysis. What I will attempt to determine is whether job mobility within this firm leads to more rapid wage increases.

This research will attempt to compare the salary growth of movers and non-movers, after adjusting for other factors that influence salaries, e.g., educational attainment, major fields of study, and performance ratings. The effect on mobility of performance ratings will also be explored, since performance ratings are a major influence on salary growth. It is thus essential to control for performance ratings in order to identify measures of mobility that do not merely reflect advancements as a reward for good prior performance.

In conclusion, I hope to discover whether individual job mobility results in larger wage increases, and what types of mobility are most highly rewarded. The results of this study could benefit personnel management by identifying

which mobility paths lead to more rapid advancement within the firm.

Chapter II introduces the concept of labor mobility and discusses job mobility in the internal labor market. Career path and career development concepts will be discussed. The chapter also reviews the literature relevant to on-the-job training.

Chapter III presents an empirical analysis of job mobility and wage growth. A description of the data base is provided and an initial conceptual model of wage growth within the firm is presented. Factors that are determinants of wage growth are discussed. The specific independent variables used in the analysis and how they are measured are presented. The interrelationship between the explanatory variables and wage growth are explored through multiple regression analysis. Chapter IV summarize the findings of the thesis and draws conclusions based on them.

## II. THEORETICAL BACKGROUND

### A. ECONOMICS OF JOB MOBILITY

#### 1. The Concept of Labor Mobility

There are at least three different ways we can conceive of the labor mobility process. The first concept is potential mobility--the ability of workers to make job moves. The second concept is mobility as a propensity to move--the willingness of workers to move. The third concept is mobility as movement--the actual movement of workers. [Ref. 4: p. 65].

##### a. Potential Mobility

This first concept of labor mobility involves the ability of workers to make job changes of various kinds. That is, it involves research on the transferability of specific skills, and the aptitudes and skills required for particular jobs. For example, is a carpenter qualified to take a job as a bricklayer? If not, how much training would be necessary to make this job switch possible?

This concept of mobility would be essential in any attempt to determine the maximum potential flexibility in the distribution of manpower in an economy. We must know the extent to which workers are able to perform alternative jobs in order to make estimates of the levels and

distribution of production that could be achieved by shifting workers among jobs. Moreover, we would want to know the skills of potential workers, people not currently in the labor force, but who could be induced into the labor force. If we attempted to construct a detailed, realistic model of a real--world economy's labor supply we would have to possess detailed knowledge of the alternative kinds of jobs that could be performed by workers in the economy. Thus we would be interested in the potential mobility within the economy.

b. Propensity to Move

Another useful concept of labor mobility is the propensity to move. Some economists have argued that labor mobility really refers to the propensity of workers to make job changes and must be separated from the actual job changes of workers [Ref. 5: p. 26].

This propensity or the willingness-to-move concept of mobility is very important for purposes of describing accurately the flexibility of the labor supply in an economy. The ability of workers to shift from one job to another, the potential mobility concept, is bound to overstate the actual degree of flexibility within an economy, especially a free enterprise economy. This is true because a worker's ability to change jobs is no guarantee that the worker will make the change at any given time. In a free

enterprise economy, no worker is forced to make a job change just because that worker is able to make the change.

On the other hand, the actual volume of voluntary job changes in an economy certainly understates the amount of labor flexibility. When flexibility is measured as actual movement, it fails to consider the movement that may have occured had the opportunities and the incentives for it been present. Thus propensity to move can be a valuable concept. The willingness of workers to make job changes provides the best indication of the extent of flexibility in a free enterprise economy's labor supply.

c. Mobility as Actual Movement

This third concept is by far the most commonly used. No matter what concept of labor mobility is preferred by various investigators, mobility is almost invariably measured in terms of the actual movement of workers.

By studying the past patterns of labor movement, one can interpret past changes in the distribution of the labor force. These patterns can then serve as the basis of predictions of the potential future flexibility of the labor supply under assumed conditions.

In this study, the term mobility will mean the actual movement of workers.[3] This movement may be in or out

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[3]The interested reader can get more detailed information about this from Herbert S. Parnes, 'Research on Labor Mobility': An appraisal of Research Findings in the United

of the labor force, between employment and unemployment, or among different jobs. Mobility under this concept covers all types of changes in the job or labor market status of a worker that alter either his function or his location in the productive process. In this thesis, however, we will focus on the different job movements within the firm.

2. Labor Mobility Classification

Labor mobility may be classified into several categories. Mobility can involve occupational movement( an occupational change); industrial movement( an industrial change); geographical movement( an area change). These three types are most widely recognized. But additionally, intra-firm movement, a job change without change of employer, occupation, or industry could be involved. Significant changes in jobs within the firm can be classified as a type of mobility. [Ref. 6: pp. 86-87].

In this thesis, the focus will be on job mobility within the firm. Obviously the above categories are not mutually exclusive. A single job change can involve a combination of the above factors. A worker can change jobs without changing employers, or with simultaneously changing employers, occupations, and geographical location, and so on.

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States, Bulletin 65, Social Science Research Council, New York( 1954).

### 3. Job Mobility Within the Internal Labor Market

#### a. Mobility and Career Path

The organizational structure of an industrial firm has interrelated functions. It provides for an orderly hierarchy of responsibility and authority, and a division of work rationally planned to meet the objective of efficient operations [Ref. 5: pp. 27-31].

Vertical and horizontal movement within a firm allocates employees to the right places at the right time. When we study the patterns of vertical and horizontal movement we can recognize that those patterns are formed by various types of career paths. These career paths allow mobile individuals to achieve their goals. Usually, a career path involves a chain of vertical and horizontal movements from position to position. For example, vertical movement is a promotion, and horizontal movement is the movement between comparable jobs in different parts of the firm without a promotion. However, horizontal movement at a certain position has a potentially positive effect on wages because of accumulated experience obtained through on-the-job training.[4]

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[4]We will discuss this in more detail in the next section "Human Capital Theory"

The performance of an individual at certain critical points affects his future career path decision; which job level he moves to, or whether to terminate. If his performance is judged to be high he may be promoted to a higher job. However, if it is not, he may be moved horizontally without promotion.

Norman and Strauss note that,

> At any given level in the executive hierarchy alternative channels of potential movement are present. In some cases those movements are multiple; the individual may move vertically and horizontally. In other cases the movements are more restricted. The more highly specialized the job, the more restrictive the move. [Ref. 7: p. 102]

In general, someone who has a fast tracking career path in the firm is expected to move rapidly along specific career paths leading to the top. Warner and Abegglen note in their article, "Within fifteen years of becoming self-supporting, more than half of the men studied were major executives and a quarter were minor executives" [Ref. 8: pp. 116-117]. A fast tracking career path can occur in two ways. Either levels of the hierarchical firm are actually 'skipped' by the employee, or alternatively, the employee follows a normal promotion pattern but at a accelerated rate without skipping levels.

## B. CAREER DEVELOPMENT AND HUMAN CAPITAL THEORY

### 1. Career Development

John Van Mannen and Edgar H. Shein note that,

> The very notion of career implies a dynamic process incorporating change and adjustment over a lifetime. In a simplified version of this process, people somehow acquire education and training that will provide them with the knowledge and skills necessary to enter the world of work. Once employed, individuals then settle into career paths defined by changes in employer and occupation over their working lives. [Ref. 9: pp. 31-33]

The term career is itself subject to different interpretations. In the broadest sense, a career may be synonymous with life time work activity. O'Toole, for example, views a career as "more than a job or series of jobs--it is a course of events that constitute a life." [Ref. 10: p. 40] A narrower interpretation equates a career with an orderly occupational progression: individuals move over time to more challenging, more responsible employment while drawing on prior accumulated skills. In this sense a career is a "particular type of work history...in which there has been a firm commitment to a given occupation or type of work." [Ref. 10: p. 42]

Thus, career development refers to upward mobility within the occupational hierarchy. This upward mobility can be accomplished through either changing employers, internal promotion within the firm, or a combination of both.

## 2. Human Capital Theory and Wage Growth

Human capital theory is discussed in Blaug's 1976 survey article. [Ref. 11: p. 628] The basis of the theory is that an employee's wage is determined by two major factors:

- the individual's educational attainment
- the work experience of the employee

Human capital theory considers work experience to be an intangible investment in on-the-job training. Thus wage differentials between employees with the same educational background are explained, almost entirely, by different levels of human capital investment in the form of work experience.

This theory implies that work experience has two dimensions which contribute to worker productivity and hence wages. The first is the formal training which is undertaken in the form of schooling, courses or other supervised instruction. The second is a consideration which includes the concept of 'learning from experience'. That is, merely a workers continued presence on the job itself constitutes a form of on-the-job training. [Ref. 12: p. 281]

Based on this theory, human capital models are developed by describing a worker's productivity and hence wages as a function of a set of employee 'traits'. These traits are developed through the combination of education

and work experience with the personality of the worker [Ref. 13: p.369]

This theory can assist in explaining the contribution of job mobility to wage differentials. Job reassignment through mobility will contribute to the depth and width of a worker's job experience by exposing him to a greater variety of work conditions. Thus mobility will add to the embodied human capital of the worker and should have a positive effect on his earnings potential.

## III. EMPIRICAL ANALYSIS

### A. DATA AND VARIABLES

The data used for this analysis were gathered from the personnel file of a large U.S. manufacturing firm. The personnel file contains starting salaries, subsequent 1978, 1981 and 1983 salaries, educational attainment levels, demographic characteristics, job progression histories, and yearly performance evaluations from 1977 through 1983.

The sample used in the study consisted of employees who were hired in 1976 or 1977, were white collar(managerial and professional) employees, and had at least a bachelor's degree. The sample size was 741 employees.

The following definitions are descriptions of variables used in this analysis.

a) DSAL1,2; Dependent variables, salary changes from 1978-1980 and 1981-1983, respectively.

b) LSAL1,2; Dependent variables, the natural logarithms of the DSA1,2.

c) NDPT77,80,82; Organizational history, dummy variables or number of Departments in which employee worked during the period through 1977, 1978-80, and 1981-82, respectively.

d) NDIV77,80,82; Organizational History, dummy variables or number of Divisions in which employee worked during the period through 1977, 1978-80, and 1981-82, respectively.

e) NFUNC 77,80,82; Organizational history, dummy variables or number of Functions in which employee worked during the period through 1977, 1978-80, and 1981-82, respectively.

f) Prior Experience; The number of years between the time of graduation from college with a B.A. and the subsequent date of hire by the firm.

g) DEGAFTER; A dummy variable for employees who were hired by the firm prior to completing their education.

h) Education Level; A series of dummy variables: Bachelor's degree, master's degree, doctorate, or other terminal degree.

i) Major Field of study; Dummy variables for the following major fields: Engineering(1), Chemistry(2), Math(3), Computers(4), Physics(5), Biology(6), Other Science(7), Geology(8), Misc. Science(9), Accounting(10), Financial(11), Business(12), Law(13), Others(14), Chemical Engineer(15), Electrical Engineer(16), Mechanical Engineer(17).

j) Performance Rating; Performance Evaluation, score 1 = highest .. score 5 = lowest.

k) AVPR80; Average performance rating in 1980.(Averaged over all preceding years for which employee had a rating)

l) Single; Someone who is not married.( = 1 if employee not married, otherwise = 0)

m) HIRE76; A dummy variable for the group of employees who were hired by the firm in 1976.

B. MODEL TO BE ESTIMATED.

In order to test whether job mobility within the firm influenced the wage growth, we can formulate a model as illustrated below. Wage growth might be influenced not only by job movement, but also by seniority, field of study, performance rating, initial job assignments, and various other factors.

We can measure job mobility by observing the number of job changes within and across the Divisions, Departments, and Functions of the firm, respectively. Thus we can estimate the relationship between wage growth and those factors previously mentioned.

Wage Growth = f (x1, x2, x3, x4, x5, .....)

where,

x1 = movements within the firm

x2 = seniority (hired in 1976 or 1977)

x3 = field of study

x4 = performance rating

x5 = number of different job assignments

The question of whether job mobility within a firm leads to more rapid wage increases is the fundamental question to be answered with these data. The other variables (educational level, major field of study, prior experience) are needed because they also influence wage growth. We need a properly specified model to identify the effects of job mobility, and the other factors that influence wage growth.

## C. SALARY CHANGE AND JOB MOVEMENTS

In this section we will discuss the results of two different wage models. One is the model of salary changes from 1978 to 1980, and the other is the model of changes in salary from 1980 to 1983.

TABLE I

1978-80 SALARY CHANGE ($) BY TYPE OF JOB CHANGE

| Type Change | 0: no change 1: change | Period of Job Change -1977 | N | 1978-80 | N |
|---|---|---|---|---|---|
| DEPT | 0 | 829 | 633 | 807 | 499 |
| | 1 | 784 | 44 | 879 | 178 |
| DIV | 0 | 826 | 617 | 832 | 334 |
| | 1 | 824 | 60 | 821 | 343 |
| FUNC | 0 | 714 | 17 | 799 | 137 |
| | 1 | 829 | 660 | 833 | 540 |

Tables I and II are simple tabulations of salary changes for employees who had job changes and those who did not. The tabulations show the general relationship between any job movement and salary change.[5]

Table I shows that the change in the average salary of the 633 employees who did not change their departments was $829 and the change in the average salary of the 44 employees who changed their departments prior to 1977 was $784. In the case of divisional moves, the change in the

[5]This analysis simply suggests whether the wage changes are affected by the job movement.

TABLE II

1980-83 SALARY CHANGE ($) BY TYPE OF JOB CHANGE

| Type Change | 0: no change 1: change | Period of Job Change -1980 | N | 1981-83 | N |
|---|---|---|---|---|---|
| DEPT | 0 | 816 | 543 | 794 | 407 |
| | 1 | 849 | 185 | 862 | 321 |
| DIV | 0 | 806 | 371 | 755 | 347 |
| | 1 | 843 | 357 | 887 | 381 |
| FUNC | 0 | 945 | 174 | 773 | 524 |
| | 1 | 786 | 554 | 957 | 204 |

average salary of the 617 personnel who did not change their divisions was $826, whereas $824 was the change in the average salary of the 60 employees who changed their divisions. The change in the average salary of the 17 employees who did not change their functions was $714 and $829 was the change in the average salary of the 660 employees who changed their functions prior to 1977.

On the other hand, the change in the average salary of the 499 employees who did not change their departments between 1978 and 1980 was $807, whereas the change in the average salary of the 178 employees who changed their

departments during that period was $879. In the case of divisional moves, the change in the average salary of the 334 personnel who did not change their divisions was $832, whereas $821 was the change in the average salary of the employees who changed their divisions. The change in the average salary of the 137 employees who did not change their functions was $799, and $833 was the change in the average salary of the 540 employees who changed their functions between 1978 and 1980.

Table II shows that the 185 employees who changed their departments received larger salary increases than those who did not, and the 357 employees who changed their divisions also received larger wage increases due to job movements prior to 1980. From 1981 to 1983, the 321 employees who changed their departments received higher salary increases than those who did not. The 381 employees who changed their divisions also received larger wage decreases as a result of job movements. In the case of functional moves, the 204 employees who changed their functions received larger salary increases than those who did not.

In general, Tables I and II show that job mobility has a positive influence on wage growth. These results are however more consistent for the period 1980-83 rather than the period 1978-80. This implies that job mobility early in the career is not as likely to result in wage growth as is

mobility in the middle of the career. Fo example, in the period 1980-83 all categories of mobility except functional change from 1978 to 1980 show larger average wage growth among mobile employees.

Tables III and IV illustrates the relationship between the number of job changes and salary change, by type of change. Table III reveals that the change in the average salary of the 43 employees who changed their departments once in the pre 1978 period was $781, and the change in the average salary of the single employee who changed his department twice in that period was $890. In the case of divisional moves, the change in the average salary of the 54 employees who changed their divisions once was $825, and the change in the average salary of the 5 employees who changed their divisions twice was $791.

In the case of functional moves, the change in the average salary of the 288 employees who changed their functions once was $810, and the change in the average salary of the 260 employees who changed their functions twice was $847. The change in the average salary of the 90 employees who changed their functions 3 times was $836 and the change in the average salary of the 20 employees tho changed their functions 4 times was $845.

With regard to the 1978 to 1980 moves, the change in the average salary of the 123 employees who changed their

departments once was $920, and the change in the average salary of the 123 employees who changed their departments twice was $793, compared with an $807 change in salary for non movers, the change in the average salary of the 54 employees who changed their departments 3 times was $570. In the case of divisional moves, the change in the average salary of the 240 employees who changed their divisions once was $816, and the change in the average salary of 88 employees who changed their divisions twice was $827. The change in the average salary of the 15 employees who changed their divisions 3 times was $851. In the case of functional moves, the change in the average salary of the 368 employees who changed their functions once was $845. The change in the average salary of the 167 employees who changed their functions twice was $806. The change in the average salary of the 5 employees who changed their functions three times was $860.

Table IV indicates that the change in the average salary of the 129 employees who changed their departments once was $875, and the change in the average salary of the 55 employees who changed their departments twice prior to 1980 was $782. The change in the average salary of the single employee who changed his department three times was $1240. In the case of divisional moves, the change in the average salary of the 252 employees who changed their divisions once

TABLE III

1978-80 SALARY CHANGE ($) BY NUMBER AND TYPE OF JOB CHANGE

| Type | Number of Changes | Period of Job Change -1977 | N | 1978-80 | N |
|---|---|---|---|---|---|
| DEPT | 0 | 829 | 633 | 807 | 499 |
| | 1 | 781 | 43 | 920 | 123 |
| | 2 | 890 | 1 | 793 | 123 |
| | 3 | – | – | 570 | 54 |
| DIV | 0 | 826 | 617 | 832 | 334 |
| | 1 | 825 | 54 | 816 | 240 |
| | 2 | 791 | 5 | 827 | 88 |
| | 3 | 890 | 1 | 851 | 15 |
| FUNC | 0 | 714 | 17 | 799 | 137 |
| | 1 | 810 | 288 | 845 | 368 |
| | 2 | 847 | 260 | 806 | 167 |
| | 3 | 836 | 90 | 860 | 5 |
| | 4 | 845 | 20 | – | – |
| | 5 | 795 | 2 | – | – |

was $811, and the change in the average salary of the 90 employees who changed their divisions twice was $912. The change in the average salary of the 15 employees who changed their divisions three times was $967. In the case of functional moves, the change in the average salary of the 377 employees who changed their functions once was $841, and the change in the average salary of the 172 employees who

TABLE IV

1980-83 SALARY CHANGE ($) BY NUMBER AND TYPE OF JOB CHANGE

| Type | Number of Changes | Period of Job Change -1980 | N | 1981-83 | N |
|---|---|---|---|---|---|
| DEPT | 0 | 816 | 543 | 794 | 407 |
| | 1 | 875 | 129 | 854 | 266 |
| | 2 | 782 | 55 | 891 | 53 |
| | 3 | 1240 | 1 | 1102 | 2 |
| DIV | 0 | 806 | 371 | 755 | 347 |
| | 1 | 811 | 252 | 855 | 259 |
| | 2 | 912 | 90 | 936 | 88 |
| | 3 | 967 | 15 | 998 | 29 |
| | 4 | - | - | 1015 | 5 |
| FUNC | 0 | 945 | 174 | 773 | 524 |
| | 1 | 841 | 377 | 957 | 185 |
| | 2 | 684 | 172 | 966 | 12 |
| | 3 | 192 | 5 | 907 | 5 |
| | 4 | - | - | 945 | 2 |

changed their functions twice was $684. Surprisingly, the change in the average salary of the 5 employees who changed their functions three times was $192. The low value of $192 may possibly be explained by the fact that a large number of moves between functions could be caused by poor work performance. That is, functional heads attempted to move poor quality workers sideways if possible and naturally

these moves would not result in wage increases or may be due to very small sample.

From 1981 to 1933, the change in the average salary of the 266 employees who changed their departments once was $854, and the change in the average salary of the 53 employees who changed their departments twice was $891. The change in the average salary of the two employees who changed their departments three times was $1102. In the divisional moves, the change in the average salary of the 259 employees who changed their departments once was $855, and the change in the average salary of the 88 employees who changed their divisions twice was $936. The change in the average salary of the 29 employees who changed their divisions three times was $998, and the change in the average salary of the 5 employees who changed their divisions four times was $1015. In the functional moves, the change in the average salary of the 185 employees who changed their functions once was $957, and the change in the average salary of the 12 employees who changed their functions twice was $966, so on.

The results of the wage growth analysis described in Table I through IV is quite consistent. Table I and II present data which support the hypothesis that job mobility is positively related to wage growth. In the majority of instances employees who changed, their departments,

divisions, or functions received, on average, higher wage increases than employees who did not. This suggested link between wage growth and mobility is reinforced by an analysis of the results of Table III and IV. When overall job mobility is disaggregated further into numbers of actual moves the positive relationship between job changes and wage growth remains in most cases. That is, job mobility increases average wage growth, but also those employees with more frequent job changes receive even larger wage increases.

While these results are generally consistent there are exceptions in all the factors where job mobility has not led to increase average wage growth. These findings are of course inconsistent with the hypothesis, and difficult to explain.

Thus, Table I through IV shows that in many cases the employees who changed their positions frequently received more rapid wage increases. Then, does job mobility within the firm really lead to more rapid wage increases ? When other factors affecting wage growth are held constant ? What other factors are related to wage changes, and which variables are more significant ? Is job mobility independent of performance ratings ? What types of mobility are most highly rewarded: across departments, divisions, or functional areas? The results of multiple regression analysis which follows will be used to answer those questions.

D. MULTIPLE REGRESSION RESULTS: EMPIRICAL FINDINGS

The multiple regression results in Tables V through VIII use dummy variables (move or stay in DPT, DIV, FUNC) to represent job movement. Table V presents the results for DSAL1 (salary changes in 1978-80) with and without performance ratings. The variables DPT80, LAW, TDEG, HIRE76, DIV80, FIN, and FUNC77 are significant for the model without the performance rating variable. DIV80 has a negative effect, indicating that employees who changed their divisions between 1978 and 1980 had a lower rate of wage growth. Also, employees in the following areas had larger increases in wage growth: employees whose major field of study was law or finance; employees who had doctorate degrees or other terminate degrees; employees hired by the firm in 1976, and finally employees who changed their functions prior to 1977.

The second model was estimated for a smaller sample of employees for whom average performance rating could be calculated. The variables AVPR80, DPT80, TDEG, DEGAFTER, DIV80, LAW, and FUNC80 are significant in the model in respect to the performance rating. The variable AVPR80 is the most significant with a large negative effect. The negative effect of AVPR80 is due to the performance rating code which uses "1" as the best rating and "5" as the worst, so that the relationship to wage growth is reversed (negative). As a result, we can see that the performance

ratings strongly influence wage growth as expected. Div80 has a negative effect; The employees who changed their divisions between 1978 and 1980 had a lower rate of wage growth than those who did not change divisions.

Comparing the two equations in Table V it can be seen that the variables DPT80, LAW, and TDEG were consistently major factors that affected wage growth. At the same time, the variables FUNC77, FIN, HIRE76 that were significant, without the performance rating variable became insignificant when the performance rating variable was added. On the contrary, the variables FUNC80, DEGAFTER are insignificant without the performance rating variable, but highly significant with the performance rating variable. The reason is that those variables are highly correlated with the performance rating measure.

Table VI presents the result of LSAL1 (natural logarithm of DSAL1) multiple regression with and without performance ratings. The variables DPT80, DIV80, TDEG, HIRE76, and Law are significant for the model without the performance rating variable. Among them, DPT80 is the most significant variable, and DIV80 has a negative effect. A second model, as above, was estimated for the sample of employees for whom average performance rating could be calculated. The variables DPT80, DIV80, FUNC80, HIRE76, TDEG, AVER80, and DEGAFTER, are significant for the model with performance

TABLE V

REGRESSION RESULTS FOR SALARY CHANGE, 1978-80

| Variable | w/o perf. rating coeff. | w/o perf. rating t-ratio | with perf. rating coeff. | with perf. rating t-ratio |
|---|---|---|---|---|
| DIV77 | 11.1410 | .2680 | -11.6321 | -.3100 |
| DPT77 | -74.3204 | -1.5030 | -7.9276 | -.1820 |
| FUNC77 | 113.6124 | 2.0250* | 78.9661 | 1.5710 |
| DIV80 | -48.9277 | -2.4550* | -53.1139 | -2.7970* |
| DPT80 | 99.5597 | 4.5000* | 113.5789 | 5.4700* |
| FUNC80 | 36.9394 | 1.6990 | 47.0069 | 2.2770* |
| LAW | 242.9477 | 3.9680* | 164.6828 | 2.6360* |
| CHEM | 282.1330 | 1.8020 | 112.3595 | .6060 |
| FIN | 174.0752 | 2.1020* | -59.9328 | -.6730 |
| HIRE76 | 49.6527 | 2.6740* | 30.4306 | 1.7160 |
| PRIOREXP | 4.5425 | 1.9120 | 4.4620 | 1.8330 |
| TDEG | 88.6085 | 2.9930* | 112.9104 | 3.9680* |
| BUS | -41.0540 | -.6190 | 26.8057 | .3910 |
| SINGLE | -24.8166 | -1.2470 | -2.9447 | -.1530 |
| MAST | -1.0246 | -.0490 | -17.2812 | -.8310 |
| AVPR80 | | | -151.9675 | -10.8390* |
| DEGAFTER | 22.8107 | .7220 | 85.1975 | 2.8560* |
| MECHENGR | 32.7632 | 1.1300 | 53.4455 | 1.9140 |
| CHEMENGR | 14.3320 | .4950 | 52.7724 | 1.8660 |
| MATH | 24.2187 | .3210 | 36.8209 | .5680 |
| ENGR | -22.0968 | -.5750 | -12.2918 | -.3360 |
| PHYS | 22.8345 | .3280 | 18.4273 | .2810 |
| OTHSCI | 5.2299 | .0470 | 44.4401 | .4710 |
| ACCTG | -35.3551 | -.6990 | -23.5383 | -.4230 |
| COMP | 120.7435 | 1.4140 | 88.8677 | 1.1340 |
| GEO | -1.4568 | -.0990 | -1.7361 | -.0090 |
| TECHN | -84.9396 | -1.1170 | -87.1012 | -1.0210 |
| ELECTENGR | 55.2237 | 1.3830 | 68.3915 | 1.7150 |
| BIO | 18.0813 | .5370 | 2.3621 | .0740 |
| OTHER | -37.2749 | -.8680 | -13.5126 | -.2810 |
| | (N=677, R square=.1402) | | (N=531, R square=.3344) | |

. The job change variables in this table are measured as dummy variables.

ratings. Compared with the basic model (DSAL1), the results are the almost same: FUNC77 and FIN were significant in the basic model without performance ratings, but in the log model, those variables became insignificant. On the other hand, the variable LAW was significant in the basic model with the performance rating. However, in the log model the LAW variable became insignificant. Conversely, the variable HIRE76 is insignificant with the performance rating variable in the basic model, but in the log model, the HIRE76 variable became significant.

The change of positive and negative effects in some variables between the model with the performance rating variables and the model without it can be disregarded because the effect of the variables such as DIV77, FIN, and BUS on wage growth is insignificant, as indicated by the t-statistic both with and without performance ratings.

Thus we can see the following results from the Table V and VI:

- divisional job changes in 1978 through 1980 have a negative effect on wage growth.
- departmental job changes in 1978 through 1980 have positive effect on wage growth.
- functional job changes in 1978 through 1980 have positive effect on wage growth.

Table VII presents the results for DSAL2 (salary changed in 1981-83), with and without performance ratings. The variables TDEG, LAW, SINGLE, FUNC80, HIRE76, DPT82, DIV82, BUS

TABLE VI

REGRESSION RESULTS FOR LOG SALARY CHANGE, 1978-80

| Variable | w/o perf. rating coeff. | w/o perf. rating t-ratio | with perf. rating coeff. | with perf. rating t-ratio |
|---|---|---|---|---|
| DIV77 | .0092 | .1830 | -.0163 | -.3410 |
| DPT77 | -.0926 | -1.5710 | -.0053 | -.0950 |
| FUNC77 | .1308 | 1.9220 | .1048 | 1.6340 |
| DIV80 | -.0799 | -3.2980* | -.0734 | -3.0310* |
| DPT80 | .1318 | 4.9090* | .1443 | 5.4470* |
| FUNC80 | .0272 | 1.0270 | .0536 | 2.0340* |
| LAW | .2234 | 3.0050* | .1215 | 1.5240 |
| CHEM | .3049 | 1.6050 | .1326 | .5600 |
| FIN | .0914 | .9090 | -.0806 | -.7090 |
| HIRE76 | .0723 | 3.2040* | .0492 | 2.1760* |
| PRIOREXP | .0039 | 1.3400 | .0046 | 1.4850 |
| TDEG | .1172 | 3.2540* | .1303 | 3.5910* |
| BUS | -.0501 | -.6220 | .0520 | .5940 |
| SINGLE | -.0422 | -1.7470 | -.0146 | -.5920 |
| MAST | -.0014 | -.0540 | -.0282 | -1.0630 |
| AVPR80 | | | -.1838 | -10.2760* |
| DEGAFTER | .0226 | .5860 | .1078 | 2.8340* |
| MECHENGR | .0310 | .8810 | .0602 | 1.6910 |
| CHEMENGR | .0015 | .0420 | .0494 | 1.3700 |
| MATH | .0299 | .3270 | .0519 | .6280 |
| ENGR | -.0515 | -1.1060 | -.0399 | -.8550 |
| PHYS | .0394 | .4670 | .0414 | .4950 |
| OTHSCI | .0269 | .2000 | .0783 | .6500 |
| ACCTG | -.0654 | -.9410 | -.0372 | -.5250 |
| COMP | .1588 | 1.5340 | .1190 | 1.1900 |
| GEO | .0202 | .1070 | .0182 | .0770 |
| TECHN | -.1368 | -1.4820 | -.1641 | -1.5080 |
| ELECTENGR | .0647 | 1.3350 | .0815 | 1.6020 |
| BIO | -.0016 | -.0400 | -.0128 | -.3130 |
| OTHER | -.0476 | -.9130 | -.0156 | -.2540 |
| | (N=675, R square=.1402) | | (N=531, R square=.3120) | |

. The job change variables in this table are measured as dummy variables.

and MAST are significant for the model without performance ratings. The employees who had doctorate or other terminal degrees had a largest rate of wage growth than those with lesser degrees. The variables FUNC80 and SINGLE had negative effect on wage growth. This indicates that the employees who changed their functions between 1978 and 1980 had a lower rate of wage growth. Single employees also had a lower rate of wage growth. The employees who changed their departments and divisions between 1981 and 1982 and those who were hired by the firm in 1976, had a larger rate of wage growth. Also, employees in the following areas had significantly larger increases in wage growth: employees who had master's degrees, doctorate degrees, or other terminal degrees; employees whose major field of study was law or business.

In the second model in Table VII, the variables AVPR80, LAW, TDEG, DIV82, FUNC80, SINGLE, FIN, DPT80, BUS, DPT82 are significant. The variable AVPR80 was still the most significant variable with negative effects (as mentioned earlier, the negative sign is due to a reversed code). So, we can see that performance ratings strongly influence wage growth, as expected. The employees whose major field of study was law, finance, or business had a larger rate of wage growth. Thus, the results are similar to the model without performance ratings

except for the following: The variables HIRE76 and MAST, significant without performance ratings, became insignificant with performance ratings. Conversely, the formerly insignificant variables DPT80 and FIN became significant. Those variables are closely correlated with performance ratings.

Table VIII shows the results for the log model of DSAL2. The results are very similar to the basic model except for the variables DIV82, DPT82, and MATH without performance ratings, and the variables DPT80, DIV82, DPT82, MATH and ENGR with performance ratings. The significant variable DPT80 in the basic model with performance ratings becomes insignificant in the log model. The variables DIV82, DPT82, significant in the basic model both with and without performance ratings became insignificant in the log model. This means that those movement variables better explain dollar wage changes than log wage changes. Also, the variable MATH, insignificant in the basic model both without and with performance ratings, became significant in the log model. The variable ENGR, insignificant in the basic model with performance rating became significant with a negative effect in the the log model.

Thus we can see the following results from the Table VII and VIII:

- divisional job changes in 1980 through 1983 have positive effect on wage growth.

- departmental job changes in 1980 through 1983 have positive effect on wage growth.
- functional job changes in 1980 through 1983 have little effect on wage growth.

The multiple regression results in table IX through XII are based on the number and type of job movements, rather than just the presence or absence of a move, as in Tables V through VIII.

Table IX shows the results for DSAL1 with and without performance ratings. The variables LAW, TDEG, FUNC77, DPT80, HIRE76, PRIOREXP, FIN, and CHEM are significant for the model without performance rating. Among them, the variable LAW was the most significant. Employees in the following categories had a greater rate of wage growth:

- major field of study being law, finance, or chemistry
- doctorate or other terminal degree
- changed their functions prior to 1977
- changed their departments between 1978 and 1980
- were hired in 1976

The number of years between the time of graduation from college with a B.A. and the subsequent date of hire by the firm was also the one of the major factors of wage growth at a higher salary. On the other hand, The variables AVPR80, TDEG, DPT80, FUNC77, DEGAFTER, CHEMENGR, LAW, MECHENGR, and PRIOREXP are significant in the basic model with performance ratings.

TABLE VII

REGRESSION RESULTS FOR SALARY CHANGE, 1981-83

| Variable | w/o perf. rating coeff. | t-ratio | with perf. rating coeff. | t-ratio |
|---|---|---|---|---|
| DIV80 | 11.5610 | .4020 | -1.6312 | -.0560 |
| DPT80 | 32.7978 | 1.0310 | 67.6677 | 2.0770* |
| FUNC80 | -141.0864 | -3.7050* | -134.6591 | -3.2750* |
| DIV82 | 71.5763 | 2.7510* | 97.3348 | 3.4710* |
| DPT82 | 89.0839 | 3.2250* | 59.4775 | 2.0330* |
| FUNC82 | 43.4278 | 1.2120 | 38.1028 | .9580 |
| LAW | 430.6008 | 4.8530* | 461.0929 | 4.6560* |
| CHEM | -203.8990 | -.9060 | 148.5622 | .5030 |
| FIN | 11.1386 | .1100 | -300.2394 | -2.1220* |
| HIRE76 | 94.9657 | 3.2980* | 43.2589 | 1.5800 |
| PRIOREXP | 1.7325 | .5180 | -2.1858 | -.5860 |
| TDEG | 226.9638 | 5.3280* | 195.7330 | 4.3280* |
| BUS | 249.0051 | 2.6060* | 223.3145 | 2.0530* |
| SINGLE | -102.1775 | -3.7370* | -94.7289 | -3.2230* |
| MAST | 65.7031 | 2.2100* | 59.9498 | 1.8300 |
| AVPR80 | | | -134.3817 | -6.1890* |
| DEGAFTER | 45.6529 | 1.1670 | -17.0891 | -.4040 |
| MECHENGR | 62.1351 | 1.5480 | 80.2997 | 1.8830 |
| CHEMENGR | 28.1723 | .6940 | 27.7070 | .6360 |
| MATH | -152.1338 | -1.4020 | -128.7674 | -1.2560 |
| ENGR | 39.0020 | .7290 | 105.4093 | 1.8880 |
| PHYS | -79.7558 | -.8010 | -41.8010 | -.4060 |
| OTHSCI | 13.1031 | .0820 | 75.6795 | .5050 |
| ACCTG | -27.7391 | -.3550 | -99.7544 | -1.1380 |
| COMP | 50.3105 | .4100 | -4.8885 | -.0390 |
| GEO | -81.6400 | -.4450 | 62.8777 | .3010 |
| TECHN | -39.7449 | -.3600 | 32.4413 | .2360 |
| ELCTENGR | 39.7891 | .7250 | 43.9037 | .7270 |
| BIO | -85.7636 | -1.8140 | -34.4568 | -.6920 |
| OTHER | -37.3621 | -.6820 | 8.4591 | .1290 |
| | (N=728, R square=.2573) | | (N=565, R square=.3573) | |

. The job change variables in this table are measured as dummy variables.

TABLE VIII

REGRESSION RESULTS FOR LOG SALARY CHANGE, 1981-83

| Variable | w/o perf. rating coeff. | w/o perf. rating t-ratio | with perf. rating coeff. | with perf. rating t-ratio |
|---|---|---|---|---|
| DIV80 | -.0068 | -.2060 | -.0120 | -.3500 |
| DPT80 | .0234 | .6570 | .0571 | 1.5710 |
| FUNC80 | -.1371 | -3.1200* | -.1216 | -2.6580* |
| DIV82 | .0363 | 1.2290 | .0601 | 1.9510 |
| DPT82 | .0522 | 1.6550 | .0111 | .3430 |
| FUNC82 | .0671 | 1.6420 | .0533 | 1.2120 |
| LAW | .3689 | 3.7250* | .3591 | 3.3510* |
| CHEM | -.2348 | -.9390 | .1627 | .5110 |
| FIN | -.1037 | -.8880 | -.4024 | -2.0460* |
| HIRE76 | .0800 | 2.7430* | .0352 | 1.1730 |
| PRIOREXP | -1.75E-04 | -.0460 | -.0028 | -.6820 |
| TDEG | .2311 | 4.8050* | .1917 | 3.8680* |
| BUS | .2526 | 2.3750* | .2348 | 1.9980* |
| SINGLE | -.0948 | -2.9910* | -.7259 | -2.1960* |
| MAST | .0475 | 1.4140 | .0502 | 1.3890 |
| AVPR80 | | | -.1642 | -6.7990* |
| DEGAFTER | .0258 | .5830 | -.0499 | -1.0760 |
| MECHENGR | .0690 | 1.5200 | .0641 | 1.3710 |
| CHEMENGR | .0551 | 1.1940 | .0594 | 1.2330 |
| MATH | -.2601 | -2.1540* | -.2468 | -2.2290* |
| ENGR | .1096 | 1.7550 | .1579 | 2.5180* |
| PHYS | -.1224 | -1.0570 | -.0325 | -.2770 |
| OTHSCI | .0039 | .0220 | .0482 | .2980 |
| ACCTG | -.0927 | -1.0430 | -.1438 | -1.4730 |
| COMP | .1082 | .7370 | -.0062 | -.0420 |
| GEO | -.0877 | -.4290 | .0595 | .2650 |
| TECHN | .1172 | .8470 | .1839 | 1.1120 |
| ELCTENGR | .0669 | 1.0760 | .0384 | .5800 |
| BIO | -.0977 | -1.8240 | -.0540 | -.9880 |
| OTHER | -.0734 | -1.1740 | .0131 | .1810 |
| | (N=688, R square=.2112) | | (N=534, R square=.2956) | |

. The job change variables in this table are measured as dummy variables.

We can also see that the variables CHEM, HIRE76, and DEGAFTER, MECHENGR, and CHEMENGR were directly correlated with the performance ratings, because the significant variables CHEM and HIRE76 in the model without performance rating were insignificant in the model with performance ratings. Conversely, the previously insignificant variables DEGAFTER, MECHENGR, and CHEMENGR became significant when the performance rating variable was added.

Table X presents the results for the natural logarithm of the basic model DSAL1. Compared with the basic model some differences exist. That is, the variable DIV80, insignificant in the basic model without performance ratings became significant in the log model. Also, the variable HIRE76, insignificant in the basic model with performance ratings became significant in the log model. Conversely, the variables FIN, CHEM, PRIOREXP, significant in the basic model without performance ratings became insignificant in the log model. The variables CHEM and PRIOREXP, significant in the basic model without performance ratings became insignificant in the log model. The variables LAW, PRIOREXP, MECHENGR, significant in the basic model with performance ratings became insignificant in the log model.

Table XI presents the results of the DSAL2 multiple regression with and without performance ratings. The variables TDEG, FUNC80, LAW, SINGLE, DPT82, BUS, HIRE76, and

TABLE IX

REGRESSION RESULTS FOR SALARY CHANGE, 1978-80

| Variable | w/o perf. rating coeff. | w/o perf. rating t-ratio | with perf. rating coeff. | with perf. rating t-ratio |
|---|---|---|---|---|
| DIV77 | 2.0849 | .0600 | -16.8556 | -.5420 |
| DPT77 | -69.7216 | -1.4930 | -3.7981 | -.0900 |
| FUNC77 | 43.7070 | 3.7790* | 38.9668 | 3.4470* |
| DIV80 | -24.0773 | -1.8100 | -17.4274 | -1.3520 |
| DPT80 | 44.8786 | 2.7600* | 56.6016 | 3.5750* |
| FUNC80 | 21.7427 | 1.5650 | 25.5093 | 1.8760 |
| LAW | 234.8555 | 3.8110* | 157.9181 | 2.4820* |
| CHEM | 316.2136 | 2.0070* | 130.9168 | .6960 |
| FIN | 173.3703 | 2.0900* | -73.6779 | -.8240 |
| HIRE76 | 43.5164 | 2.3110* | 28.0513 | 1.5520 |
| PRIOREXP | 5.2310 | 2.1870* | 5.0535 | 2.0530* |
| TDEG | 116.9367 | 3.7860* | 139.1849 | 4.6270* |
| BUS | -22.7609 | -.3410 | 53.2743 | .7660 |
| SINGLE | -19.2094 | -.9580 | 1.4307 | .0730 |
| MAST | 5.0255 | .2360 | -15.6239 | -.7390 |
| AVPR80 | | | -148.5963 | -10.4080* |
| DEGAFTER | 21.5702 | .6790 | 86.4861 | 2.8600* |
| MECHENGR | 36.0690 | 1.2390 | 59.9828 | 2.1200* |
| CHEMENGR | 30.9196 | 1.0620 | 71.1832 | 2.4850* |
| MATH | 20.3626 | .2680 | 38.1712 | .5800 |
| ENGR | -33.9825 | -.8920 | -24.2559 | -.6630 |
| PHYS | 4.6011 | .0660 | -2.5567 | -.0390 |
| OTHSCI | -13.2821 | -.1190 | 30.5245 | .3190 |
| ACCTG | -25.3680 | -.4400 | -5.7185 | -.1010 |
| COMP | 118.3885 | 1.3800 | 92.4712 | 1.1620 |
| GEO | 42.3692 | .2680 | 28.7877 | .1520 |
| TECHN | -96.4997 | -1.2590 | -102.6942 | -1.1780 |
| ELECTENGR | 57.0030 | 1.4200 | 66.9398 | 1.6570 |
| BIO | 32.3671 | .9540 | 22.0833 | .6790 |
| OTHER | -29.4106 | -.6810 | 3.2497 | .0670 |
| | (N=677, R square=.1308) | | (N=531, R square=.3145) | |

. The job change variables in this table are measured as the number of changes.

TABLE X

REGRESSION RESULTS FOR LOG SALARY CHANGE, 1978-80

| Variable | w/o perf. rating coeff. | w/o perf. rating t-ratio | with perf. rating coeff. | with perf. rating t-ratio |
|---|---|---|---|---|
| DIV77 | -.0026 | -.0620 | -.0254 | -.6390 |
| DPT77 | -.0839 | -1.4780 | .0016 | .0300 |
| FUNC77 | .0512 | 3.6280* | .0513 | 3.5630* |
| DIV80 | -.0334 | -2.3750* | -.0227 | -1.3810 |
| DPT80 | .0603 | 3.0520* | .0707 | 3.5040* |
| FUNC80 | .0201 | 1.1840 | .0337 | 1.9430 |
| LAW | .2131 | 2.8430* | .1102 | 1.3600 |
| CHEM | .3481 | 1.8190 | .1582 | .6600 |
| FIN | .0940 | .9320 | -.0998 | -.8750 |
| HIRE76 | .0654 | 2.8540* | .0459 | 1.9920* |
| PRIOREXP | .0047 | 1.6100 | .0053 | 1.7040 |
| TDEG | .1505 | 3.9980* | .1660 | 4.3300* |
| BUS | -.0218 | -.2690 | .0863 | .9730 |
| SINGLE | -.0367 | -1.5040 | -.0098 | -.3890 |
| MAST | .0061 | .2340 | -.0256 | -.9500 |
| AVPR80 | | | -.1795 | -9.8640* |
| DEGAFTER | .0217 | .5570 | .1099 | 2.8520* |
| MECHENGR | .0352 | .9950 | .0680 | 1.8850 |
| CHEMENGR | .0217 | .6120 | .0729 | 1.9970* |
| MATH | .0276 | .2990 | .0536 | .6390 |
| ENGR | -.0652 | -1.4080 | -.0552 | -1.1830 |
| PHYS | .0183 | .2170 | .0159 | .1900 |
| OTHSCI | -.0028 | -.0200 | .0567 | .4660 |
| ACCTG | -.0485 | -.6920 | -.0142 | -.1970 |
| COMP | .1507 | 1.4450 | .1230 | 1.2120 |
| GEO | .0722 | .3770 | .0564 | .2330 |
| TECHN | -.1499 | -1.6090 | -.1853 | -1.6680 |
| ELECTENGR | .0663 | 1.3600 | .0791 | 1.5360 |
| BIO | .0176 | .4260 | .0142 | .3430 |
| OTHER | -.0371 | -.7080 | .0074 | .1190 |
| | (N=675, R square=.1275) | | (N=531, R square=.2926) | |

. The job change variables in this table are measured as the number of changes.

MAST are significant for the model without performance ratings. Among them the variable TDEG was the most highly significant variable. The variables FUNC80 and SINGLE have a negative coefficient. This indicates that single employees, and those who changed their functions between 1978 and 1980 experienced a lower rate of wage growth. We can see that the employees who had business degrees, law degrees, or other terminal degrees had a greater rate of wage growth. The employees who changed their departments between 1981 and 1982, the employees hired by the firm in 1976, and the employees who changed their departments between 1981 and 1983 also had a larger rate of wage growth.

Table XI also shows, when AVPR80 is added to the equation, that the variables AVPR80, TDEG, FUNC80, LAW, BUS, SINGLE, DPT82, MECHENGR, MAST, FIN, and DIV82 have a significant effect on wage growth. The variable AVPR80 is the most significant variable. Among the others, FUNC80, FIN and SINGLE have a negative effect on wage growth. We can also see that the variables HIRE76, DIV82, MECHENGR, and FIN are directly correlated to the performance ratings, since their effects change when AVPR80 is added to the equation.

Table XII shows the log model of DSAL2. This is also similar to the basic model. However, there are some changes. That is, the variables DIV82, DPT82, SINGLE, MECHENGR, significant in the basic model with performance ratings, and

TABLE XI

REGRESSION RESULTS FOR SALARY CHANCE, 1981-83

| Variable | w/o perf. rating coeff. | t-ratio | with perf. rating coeff. | t-ratio |
|---|---|---|---|---|
| DIV80 | 28.8384 | 1.5370 | 15.6061 | .7790 |
| DPT80 | -.1601 | -.0070 | 29.1658 | 1.2210 |
| FUNC80 | -106.0151 | -5.2750* | -105.4437 | -4.8540* |
| DIV82 | 25.6819 | 1.6460 | 34.2194 | 2.0400* |
| DPT82 | 70.3160 | 3.4130* | 53.0396 | 2.5330* |
| FUNC82 | 12.5378 | .5100 | 5.5626 | .2040 |
| LAW | 412.4782 | 4.7500* | 432.4590 | 4.4660* |
| CHEM | -248.0799 | -1.1020 | 68.9629 | .2380 |
| FIN | 14.6779 | .1480 | -286.0836 | -2.0940* |
| HIRE76 | 73.7055 | 2.8850* | 39.3469 | 1.4650 |
| PRIOREXP | 3.6143 | 1.0930 | .4752 | .1300 |
| TDEG | 253.8039 | 6.0510* | 227.2824 | 5.1250* |
| BUS | 308.4904 | 3.2510* | 288.8085 | 2.6950* |
| SINGLE | -93.5478 | -3.4680* | -75.1917 | -2.6030* |
| MAST | 79.5277 | 2.7670* | 65.8301 | 2.0950* |
| AVPR80 | | | -127.9447 | -6.0030* |
| DEGAFTER | 19.0323 | .4960 | -38.6269 | -.9390 |
| MECHENGR | 64.2413 | 1.6240 | 94.2045 | 2.2600* |
| CHEMENGR | 49.0316 | 1.2350 | 57.1782 | 1.3550 |
| MATH | -121.2601 | -1.1350 | -90.9222 | -.9070 |
| ENGR | 27.9950 | .5330 | 103.5623 | 1.9010 |
| PHYS | -59.8080 | -.6130 | -9.9957 | -.1000 |
| OTHSCI | -3.0319 | -.0190 | 64.7705 | .4440 |
| ACCTG | 2.5693 | .0330 | -55.3423 | -.6440 |
| COMP | 14.8751 | .1230 | -26.2267 | -.2170 |
| GEO | -18.3965 | -.1020 | 133.4959 | .6740 |
| TECHN | -55.2220 | -.5120 | -24.6970 | -.1850 |
| ELCTENGR | 52.3189 | .9650 | 56.1066 | .9430 |
| BIO | -45.3444 | -.9770 | 15.6076 | .3210 |
| OTHER | -54.1293 | -1.0060 | 4.2364 | .0660 |
| | (N=728, R square=.2808) | | (N=565, R square=.3573) | |

. The job change variables in this table are measured as the number of changes.

the variable MAST in the basic model without performance ratings, become insignificant. Conversely, the variable ENGR, insignificant in the basic model with performance ratings, becomes significant in the log model. The variable MATH, significant in the basic model both with and without performance ratings becomes insignificant in the log model.

TABLE XII

REGRESSION RESULTS FOR LOG SALARY CHANGE, 1981-83

| Variable | w/o perf. rating coeff. | t-ratio | with perf. rating coeff. | t-ratio |
|---|---|---|---|---|
| DIV80 | .0190 | .8960 | .0105 | .4730 |
| DPT80 | -.0068 | -.2630 | .0225 | .8410 |
| FUNC80 | -.1218 | -5.1920* | -.1081 | -4.3950* |
| DIV82 | .0134 | .7640 | .0249 | 1.3550 |
| DPT82 | .0478 | 2.0430* | .0240 | 1.0720 |
| FUNC82 | .0170 | .6130 | .0081 | .2680 |
| LAW | .3651 | 3.7650* | .3493 | 3.3180* |
| CHEM | -.2550 | -1.0180 | .1282 | .4090 |
| FIN | -.0911 | -.7960 | -.3983 | -2.4390* |
| HIRE76 | .0725 | 2.5030* | .0316 | 1.0660 |
| PRIOREXP | .0017 | .4470 | -5.8E-04 | -.1420 |
| TDEG | .1891 | 3.7310* | .2244 | 4.5830* |
| BUS | .3251 | 3.0730* | .3037 | 2.6090* |
| SINGLE | -.0907 | -2.9040* | -.0601 | -1.8440 |
| MAST | .0634 | 1.9470 | .0613 | 1.7560 |
| AVPR80 | | | -.1564 | -6.6500* |
| DEGAFTER | -.0037 | -.0860 | -.0776 | -1.7200 |
| MECHENGR | .0726 | 1.6230 | .0798 | 1.7350 |
| CHEMENGR | .0750 | 1.6560 | .0894 | 1.9090 |
| MATH | -.2201 | -1.8430 | -.2015 | -1.8510 |
| ENGR | .1039 | 1.6900 | .1582 | 2.5730* |
| PHYS | -.0879 | -.7740 | .0119 | .1040 |
| OTHSCI | -.0085 | -.0490 | .0413 | .2610 |
| ACCTG | -.0638 | -.7300 | -.1094 | -1.1360 |
| COMP | .0705 | .4890 | -.0175 | -.1230 |
| GEO | -.0237 | -.1170 | .1256 | .5640 |
| TECHN | .0967 | .7150 | .1515 | .9400 |
| ELCTENGR | .0773 | 1.2550 | .0517 | .7900 |
| BIO | -.0527 | -.9990 | -.0028 | -.0520 |
| OTHER | -.0966 | -1.5780 | -1.98E-04 | -.0030 |
| | (N=688, R square=.2346) | | (N=534, R square=.3192) | |

. The job change variables in this table are measured as the number of changes.

## IV. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This thesis has analyzed the effect of job mobility on wage differentials in the context of human capital theory. This was accomplished by using two models:

- simply comparing job mobility and wage growth.
- utilizing multiple regression analysis to control for a large number of variables which were thought to have an effect on wage growth.

The results obtained generally support the hypothesis that job mobility increases the human capital of the workers and adds to their productivity, since the job mobility measures generally have a positive effect on wage growth. Specifically, the following summaries identify the effects of job changes on wage growth as indicated in Table XIII.

a) Early in Career

- divisional job mobility had negative effect on wage growth.
- departmental job mobility had positive effect on wage growth.
- functional job mobility had positive effect on wage growth.

b) Middle in Career

- divisional job mobility had positive effect on wage growth.
- departmental job mobility had positive effect on wage growth.
- functional job mobility had little effect on wage growth.

TABLE XIII

TYPE OF MOBILITY EFFECT ON WAGE GROWTH

| Type | Wage Growth (78-80) | | Wage Growth (80-83) | |
|---|---|---|---|---|
| | Normal | Log | Normal | Log |
| DIV | | | | |
| 77 | NS | NS | . | . |
| 80 | (-) | (-) | NS | NS |
| 82 | . | . | (+) | (+) |
| DEPT | | | | |
| 77 | NS | NS | . | . |
| 80 | (+) | (+) | (+) | NS |
| 82 | . | . | (+) | NS |
| FUNC | | | | |
| 77 | NS | NS | . | . |
| 80 | (-) | (+) | (-) | (-) |
| 82 | . | . | NS | NS |

On the other hand, Table XIV summarizes the other variables' effects on wage growth.

As shown Table XIV, the variables AVPR80, TDEG, LAW had positive effect on wage growth through whole career. However, the variable DEGAFTER had a positive effect on wage growth during the early career, and the variables FIN and SINGLE had a negative effect on wage growth during middle career.

TABLE XIV

EFFECTS OF JOB CHANGES ON WAGE GROWTH

| Type | Wage Growth (78-80) | | Wage Growth (80-83) | |
|---|---|---|---|---|
| | Normal | Log | Normal | Log |
| LAW | (+) | NS | (+) | (+) |
| CHEM | NS | NS | NS | NS |
| FIN | NS | NS | (-) | (-) |
| HIRE76 | NS | (+) | NS | NS |
| PRIOREXP | NS | NS | NS | NS |
| TDEG | (+) | (+) | (+) | (+) |
| BUS | NS | NS | (+) | (+) |
| SINGLE | NS | NS | (-) | (-) |
| MAST | NS | NS | NS | NS |
| AVPR80 | (+) | (+) | (+) | (+) |
| DEGAFTER | (+) | (+) | NS | NS |

It should be noted that the other variables in the model should not be ignored. Theory suggests that they should have an effect on wage growth. In this analysis their effect is insignificant, but this may only be true for the data used in this analysis. Therefore the potential effect on wage growth of the other variables should not be dismissed in general.

Thus the major conclusion of this study is that, holding other factors contributing to wage growth constant (as was done in the regression analysis), job mobility of itself

contributes significantly to the productivity of a worker. This increase in productivity is reflected by the increase in wages of mobile workers.

# APPENDIX A

## DATA PROGRAMMING 1 (SPSS-X)

```
//KIMDAT5  JOB (4750,9999),'MAJOR SPSSX',CLASS=B
//    EXEC SPSSX
//DATAIN DD DISP=SHR,DSN=MSS.F4750.KIMDAT1
//SYSIN DD *
SET                 WIDTH = 80
DATA LIST           FILE = DATAIN  RECORDS = 1
                         / 1 SSN1 2-5 SSN2 6-10
                    RACE 11 (A) SEX 12 (A)
                    HYR HMO HDA 19-24
                    ORGYR2 37-38 ORGMO2 39-40 ORGDA2 41-42
                    DPT2 43-44   DIV2 45-46     SCT2 47-48
                    ORGYR3 49-50 ORGMO3 51-52 ORGDA3 53-54
                    DPT3 55-56   DIV3 57-58     SCT3 59-60
                    ORGYR4 61-62 ORGMO4 63-64 ORGDA4 65-66
                    DPT4 67-68   DIV4 69-70     SCT4 71-72
                    ORGYR5 73-74 ORGMO5 75-76 ORGDA5 77-78
                    DPT5 79-80   DIV5 81-82     SCT5 83-84
                    ORGYR6 85-86 ORGMO6 87-88 ORGDA6 89-90
                    DPT6 91-92   DIV6 93-94     SCT6 95-96
                ORGYR7 97-98 ORGMO7 99-100 ORGDA7 101-102
                DPT7 103-104 DIV7 105-106 SCT7 107-108
                ORGYR8 109-110 ORGMO8 111-112 ORGDA8 113-114
                DPT8 115-116 DIV8 117-118 SCT8 119-120
                ORGYR9 121-122 ORGMO9 123-124 ORGDA9 125-126
              DPT9 127-128 DIV9 129-130 SCT9 131-132
              ORGYR10 133-134 ORGMO10 135-136 ORGDA10 137-138
              DPT10 139-140 DIV10 141-142 SCT10 143-144
              ORGYR11 145-146 ORGMO11 147-148 ORGDA11 149-150
              DPT11 151-152 DIV11 153-154 SCT11 155-156
              ORGYR12 157-158 ORGMO12 159-160 ORGDA12 161-162
              DPT12 163-164 DIV12 165-166 SCT12 167-168
              ORGYR13 169-170 ORGMO13 171-172 ORGDA13 173-174
              DPT13 175-176 DIV13 177-178 SCT13 179-180
              ORGYR14 181-182 ORGMO14 183-184 ORGDA14 185-186
              DPT14 187-188 DIV14 189-190 SCT14 191-192
              ORGYR15 193-194 ORGMO15 195-196 ORGDA15 197-198
              DPT15 199-200 DIV15 201-202 SCT15 203-204
              ORGYR16 205-206 ORGMO16 207-208 ORGDA16 209-210
              DPT16 211-212 DIV16 213-214 SCT16 215-216
```

```
SITEYR2 227-228 SITEMO2 229-230 SITEDA2 231-232 SITE2 233-236
SITEYR3 237-238 SITEMO3 239-240 SITEDA3 241-242 SITE3 243-246
SITEYR4 247-248 SITEMO4 249-250 SITEDA4 251-252 SITE4 253-256
SITEYR5 257-258 SITEMO5 259-260 SITEDA5 261-262 SITE5 263-266
SITEYR6 267-268 SITEMO6 269-270 SITEDA6 271-272 SITE6 273-276
SITEYR7 277-278 SITEMO7 279-280 SITEDA7 281-282 SITE7 283-286
SITEYR8 287-288 SITEMO8 289-290 SITEDA8 291-292 SITE8 293-296
SITEYR9 297-298 SITEMO9 299-300 SITEDA9 301-302 SITE9 303-306
SITEYR10 307-308 SITEMO10 309-310 SITEDA10 311-312
SITE10 313-316 SITEYR11 317-318 SITEMO11 319-320
SITEDA11 321-322 SITE11 323-326 JBYR2 363-364 JBYR3 399-400
JBYR4 435-436 JBYR5 474-475 JBYR6 510-511 JBYR7 546-547
JBYR8 582-583 JBYR9 618-619 JBYR10 654-655 JBYR11 690-691
JBYR12 726-727 JBYR13 762-763 JBYR14 798-799 JBYR15 834-835
JBYR16 870-871 JBMO2 365-366 JBMO3 401-402 JBMO4 437-438
JBMO5 476-477 JBMO6 512-513 JBMO7 548-549 JBMO8 584-585
JBMO9 620-621 JBMO10 656-657 JBMO11 692-693 JBMO12 728-729
JBMO13 764-765 JBMO14 800-801 JBMO15 836-837 JBMO16 872-873
JBDA2 367-368 JBDA3 403-404 JBDA4 439-440
JBDA5 478-479 JBDA6 514-515 JBDA7 550-551
JBDA8 586-587 JBDA9 622-623 JBDA10 658-659
JBDA11 694-695 JBDA12 730-731 JBDA13 766-767
JBDA14 802-803 JBDA15 838-839 JBDA16 874-875
JBYR1 327-328
    FUNC1 360(A)     SUBF1 361-362(A)
    SUPV2 FUNC2 395-396(A) SUBF2 397-398(A)
    SUPV3 FUNC3 431-432(A) SUBF3 433-434(A)
    SUPV4 FUNC4 467-468(A) SUBF4 469-470(A)
    SUPV5 FUNC5 503-504(A) SUBF5 505-506(A)
    SUPV6 FUNC6 539-540(A) SUBF6 541-542(A)
    SUPV7 FUNC7 575-576(A) SUBF7 577-578(A)
    SUPV8 FUNC8 611-612(A) SUBF8 613-614(A)
    SUPV9 FUNC9 647-648(A) SUBF9 649-650(A)
    SUPV10 FUNC10 683-684(A) SUBF10 685-686(A)
    SUPV11 FUNC11 719-720(A) SUBF11 721-722(A)
    SUPV12 FUNC12 755-756(A) SUBF12 757-758(A)
    SUPV13 FUNC13 791-792(A) SUBF13 793-794(A)
    SUPV14 FUNC14 827-828(A) SUBF14 829-830(A)
    SUPV15 FUNC15 863-864(A) SUBF15 865-866(A)
    SUPV16 FUNC16 899-900(A) SUBF16 901-902(A)
           SGYR2 914-915  SGYR3 925-926  SGYR4 936-937
           SGYR5 947-948
           SGYR6 958-959 SGYR7 969-970
           SGYR8 980-981
           SGYR9 991-992 SGYR10 1002-1003
           SGYR11 1113-1114
SGMO2 916-917 SGMO3 927-928 SGMO4 938-939
SGMO5 949-950 SGMO6 960-961 SGMO7 971-972 SGMO8 982-983
SGMO9 993-994 SGMO10 1004-1005 SGMO11 1015-1016
SGDA2 918-919 SGDA3 929-930 SGDA4 940-941
SGDA5 951-952 SGDA6 962-963 SGDA7 973-974 SGDA8 984-985
SGDA9 995-996 SGDA10 1006-1007 SGDA11 1017-1018
```

```
                    SSGL2 920-922(A) SSGL3 931-933(A)
                    SSGL4 942-944(A) SSGL5 953-955(A)
                    SSGL6 964-966(A) SSGL7 975-977(A)
                    SSGL8 986-988(A) SSGL9 997-999(A)
                    SSGL10 1008-1010(A)
                    SSGL11 1019-1021(A) CURRSAL 1024-1028
                    CURRSYY 1029-1030 CURRSMM 1031-1032
                    CURRSDD 1033-1034 FIRSTSAL 1035-1039
                    SAL78 1040-1044 SAL81 1045-1049
RATEYY1 1050-1051 RATMO1 1052-1053 RATEDA1 1054-1055
RATEYY2 1058-1059 RATMO2 1060-1061 RATEDA2 1062-1063
RATEYY3 1066-1067 RATMO3 1068-1069 RATEDA3 1070-1071
RATEYY4 1074-1075 RATMO4 1076-1077 RATEDA4 1078-1079
RATEYY5 1082-1083 RATMO5 1084-1085 RATEDA5 1086-1087
RATEYY6 1090-1091 RATMO6 1092-1093 RATEDA6 1094-1095
RATEYY7 1098-1099 RATMO7 1100-1101 RATEDA7 1102-1103
                    PERF1 1056(A)
                    PERF2 1064(A)
                    PERF3 1072(A)
                    PERF4 1080(A)
                    PERF5 1088(A)
                    PERF6 1096(A)
                    PERF7 1104(A)
                    DEGREE1 1106-1108(A)
                    DEGREE2 1118-1120(A)
                    DEGREE3 1130-1132(A)
                    DEGREE4 1142-1144(A)
                    EDYY1 1109-1110
                    EDYY2 1121-1122
                    EDYY3 1133-1134
                    EDYY4 1145-1146
                    FIELD1 1111-1113
                    FIELD2 1123-1125
                    FIELD3 1135-1137
                    FIELD4 1147-1149
                    COLCD1 1114-1117 COLCD2 1126-1129
                    COLCD3 1138-1141 COLCD4 1150-1153
                    CHILDYY1 1154-1155 CHILDYY2 1156-1157
                    CHILDYY3 1158-115  CHILDYY4 1160-1161
                    CHILDYY5 1162-11
                    SPOUSE 1164(A)     YY 1165-1166
                    TERMREAS 1167-1    ) COSTAT 1169(A)
                    TERMGT1 1170(A)
```

## APPENDIX B

## DATA PROGRAMMING 2 (SPSS-X)

```
STRING            HIDEGR (A3)
COMPUTE           HIDEGR=DEGREE1
RECODE DEGREE2 ('JD','MD','PHD' = 1)  (ELSE = 2) INTO TDG2
RECODE DEGREE1 ('JD','MD','PHD','DVM'=1)(ELSE= 2)INTO TDG1
IF                  (TDG2=1 AND TDG1 NE 1)HIDEGR=DEGREE2
COMPUTE             YEAR=EDYY1
IF                  (TDG2=1 AND TDG1 NE 1)YEAR=EDYY2
COMPUTE             MAJOR=FIELD1
IF                  (TDG2=1 AND TDG1 NE 1)MAJOR=FIELD2
IF                  (TDG2=1 AND DEGREE1 NE ' ')XTRADEG=1
RECODE        HIDEGR ('AAS'=1)(' '=2)(ELSE=3) INTO NDEGR
SELECT IF     (NDEGR=3)
RECODE        HIDEGR ('BC'=1)('BN'=1)('BT'=1) INTO ED

RECODE        HIDEGR ('B'=1)('B5'=1) INTO ED
RECODE        HIDEGR ('E'=2)('M'=2) INTO ED
RECODE        HIDEGR ('DO'=3)('DVM'=3)('JD'=3)
                     ('MD'=3)('PHD'=3) INTO ED
COMPUTE             BACH=0
IF                  (ED=1) BACH=1
COMPUTE             MAST=0
IF                  (ED=2) MAST=1
COMPUTE             TDEG=0
IF                  (ED=3) TDEG=1
COMPUTE             ENGR=0
IF                  (MAJOR GE 100 AND MAJOR LE 165)ENGR=1
IF                  (MAJOR EQ 120 OR
                     MAJOR EQ 128 OR
                     MAJOR EQ 140)      ENGR=0
COMPUTE             CHEM=0
IF                  (MAJOR GE 300 AND MAJOR LE 345)CHEM=1
COMPUTE             MATH=0
IF  (MAJOR GE 400 AND MAJOR LE 405 OR MAJOR = 490)MATH=1
COMPUTE             COMP=0
IF                  (MAJOR EQ 466 OR  MAJOR EQ 478)COMP=1
COMPUTE             PHYS=0
IF                  (MAJOR GE 410 AND MAJOR LE 429)PHYS=1
COMPUTE             BIO=0
IF    (MAJOR GE 430 AND MAJOR LE 458 OR MAJOR =468)BIO=1
COMPUTE             OTHSCI=0
```

```
RECODE  MAJOR (460,462,464,484,491,495 = 1 ) INTO OTHSCI
COMPUTE              GEO=0
RECODE  MAJOR (468,470,471,473,488     = 1 ) INTO GEO
COMPUTE               TECHN=0
RECODE  MAJOR (475,476,481,489         = 1 ) INTO TECHN
RECODE  MAJOR (469,479,482,494,498     = 1 ) INTO BIO
RECODE  MAJOR (480,483                 = 1 ) INTO PHYS
COMPUTE               CHEM = 0
RECODE  MAJOR (492,493,496             = 1 ) INTO CHEM
COMPUTE              OTHER=0
IF                   (MAJOR GE 607 OR MAJOR EQ 472)OTHER=1
COMPUTE              ACCTG=0
IF                   (MAJOR =500)ACCTG=1
COMPUTE              FIN=0
IF                   (MAJOR =505 OR MAJOR EQ 513)FIN=1
RECODE MAJOR (507,510,517,518,519      = 1 ) INTO BUS
COMPUTE              BUS=0
IF                   (MAJOR GE 525 AND MAJOR LE 604)BUS=1
COMPUTE              CHMENGR=0
IF                   (MAJOR=120)CHMENGR=1
COMPUTE              ELCTENGR=0
IF                   (MAJOR=128)ELCTENGR=1
COMPUTE              MECHENGR=0
IF                   (MAJOR=140)MECHENGR=1
COMPUTE              LAW=0
IF                   (MAJOR=521) LAW=1
COMPUTE              MAJR=0
IF                   (ENGR=1)MAJR=1
IF                   (CHEM=1)MAJR=2
IF                   (MATH=1)MAJR=3
IF                   (COMP=1)MAJR=4
IF                   (PHYS=1)MAJR=5
IF                   (BIO=1)MAJR=6
IF                   (OTHSCI=1)MAJR=7
IF                   (GEO=1)MAJR=8
IF                   (TECHN=1)MAJR=9
IF                   (ACCTG=1)MAJR=10
IF                   (FIN=1)MAJR=11
IF                   (BUS=1)MAJR=12
IF                   (LAW=1)MAJR=13
IF                   (OTHER=1)MAJR=14
IF                   (CHMENGR=1)MAJR=15
IF                   (ELCTENGR=1)MAJR=16
IF                   (MECHENGR=1)MAJR=17
VALUE LABELS         MAJOR (1)ENGINEER (2)CHEMISTRY (3)MATH
                           (4)COMPUTERS (5)PHYSICS (6)BIOLOGY
                           (7)OTHER SCIENCES (8)GEOLOGY
                           (9)MISC TECHNICAL (10)ACCOUNTING
                           (11)FINANCE (12)BUSINESS (13)LAW
                           (14)OTHER (15)CHEM ENGINEER
                      (16)ELECTRICAL ENG (17)MECHANICAL ENGR
DO REPEAT    SGL=SSGL2,SSGL3,SSGL4,SSGL5,SSGL6,SSGL7,SSGL8,
```

```
                SSGL9,SSGL10,SSGL11/
            NSGL=NSSGL2,NSSGL3,NSSGL4,NSSGL5,NSSGL6,NSSGL7,
                NSSGL8,NSSGL9,NSSGL10,NSSGL11/
RECODE    SGL('02'=20)('02A'=25)('03'=30)('03A'=35)('04'=40)
            ('04A'=40)('05'=50)('05A'=50)('06'=60)('06A'=65)
            ('07'=70)('07A'=75)(ELSE=99)INTO NSGL
END REPEAT
COMPUTE              AVPERF82=0
COMPUTE              N82=0
COMPUTE              AVPERF80=0
COMPUTE              N80=0
DO REPEAT            PERF= PERF7,PERF6,PERF5,PERF4,
                           PERF3,PERF2,PERF1/
                    NPERF= NPERF7,NPERF6,NPERF5,NPERF4,
                           NPERF3,NPERF2,NPERF1/
                    PERFYR=RATEYY7,RATEYY6,RATEYY5,RATEYY4,
                           RATEYY3,RATEYY2,RATEYY1/
RECODE              PERF('O'=1)('V'=2)('G'=3)('S'=4)('U'=5)
                    ('F'=2)('N'=3)('L'=4)(ELSE=99) INTO NPERF
IF    (PERFYR LE 80 AND NPERF NE 99) N80=N80+1
IF    (PERFYR LE 80 AND NPERF NE 99) AVPERF80=AVPERF80+NPERF
IF (PERFYR GT 80 AND PERFYR LE 82 AND NPERF NE 99)N82=N82+1
IF         (PERFYR GT 80 AND PERFYR LE 82 AND NPERF NE 99)
           AVPERF82=AVPERF82+NPERF
END REPEAT
COMPUTE AVPR80=0
IF      (N80 GE 1) AVPR80=AVPERF80/N80
COMPUTE AVPR82=0
IF      (N82 GE 1) AVPR82=AVPERF82/N82
MISSING VALUES AVPR80(0)
MISSING VALUES AVPR82(0)
COMPUTE              PRIOREXP = 0
IF                   (HYR-YEAR GE 0) PRIOREXP=HYR-YEAR
COMPUTE              DEGAFTER = 0
IF                   (HYR-YEAR LT 0) DEGAFTER=1
COMPUTE              SINGLE = 0
IF                   (SPOUSE='N')    SINGLE=  1
COMPUTE              NDIV77 EQ 0
COMPUTE              NDIV80 EQ 0
COMPUTE              NDIV82 EQ 0
COMPUTE              NDPT77 EQ 0
COMPUTE              NDPT80 EQ 0
COMPUTE              NDPT82 EQ 0
DO REPEAT            DPT=DPT15,DPT14,DPT13,DPT12,DPT11,
                         DPT10,DPT9,DPT8,DPT7,DPT6,
                         DPT5,DPT4,DPT3,DPT2/
                     DPTL=DPT16,DPT15,DPT14,DPT13,
                          DPT12,DPT11,DPT10,DPT9,DPT8,DPT7,
                          DPT6,DPT5,DPT4,DPT3/
                     ORGYR=ORGYR15,
                         ORGYR14,ORGYR13,ORGYR12,ORGYR11,
                         ORGYR10,ORGYR9,ORGYR8,ORGYR7,ORGYR6,
```

```
                        ORGYR5,ORGYR4,ORGYR3,ORGYR2/
                    DIV=DIV15,DIV14,DIV13,DIV12,DIV11,
                        DIV10,DIV9,DIV8,
                        DIV7,DIV6,DIV5,DIV4,DIV3,DIV2/
                    DIVL=DIV16,DIV15,DIV14,DIV13,
                         DIV12 DIV11,DIV10,DIV9,DIV8,
                         DIV7,DIV6,DIV5,DIV4,DIV3/
IF  (DPT NE DPTL AND ORGYR LE 77)NDPT77 EQ NDPT77 + 1
IF  (DPT NE DPTL AND (ORGYR GT 77 AND ORGYR LE 80))
    NDPT80 EQ NDPT80 + 1
IF  (DPT NE DPTL AND ORGYR GT 80)NDPT82 EQ NDPT82 + 1
IF  (DIV NE DIVL AND ORGYR LE 77)NDIV77 EQ NDIV77 + 1
IF  (DIV NE DIVL AND (ORGYR GT 77 AND ORGYR LE 80))
    NDIV80 EQ NDIV80 + 1
IF  (DIV NE DIVL AND ORGYR GT 80)NDIV82 EQ NDIV82 + 1
END REPEAT
DO REPEAT FUNC EQ FUNC16,FUNC15,FUNC14,
                  FUNC13,FUNC12,FUNC11,FUNC10,FUNC9,FUNC8,
                  FUNC7,FUNC6,FUNC5,FUNC4,FUNC3,FUNC2,FUNC1/
                  JBYR EQ JBYR16,JBYR15,JBYR14,JBYR13,JBYR12,
                  JBYR11,JBYR10,JBYR9,JBYR8,JBYR7,JBYR6,
                  JBYR5,JBYR4,JBYR3,JBYR2,JBYR1/
          SUBF EQ SUBF16,SUBF15,SUBF14,SUBF13,SUBF12,SUBF11,
                  SUBF10,SUBF9,SUBF8,SUBF7,SUBF6,SUBF5,
                  SUBF4,SUBF3,SUBF2,SUBF1/
          NFUNC=NFUNC16,NFUNC15,NFUNC14,NFUNC13,NFUNC12,
                NFUNC11,NFUNC10,NFUNC9,NFUNC8,NFUNC7,NFUNC6,
                NFUNC5,NFUNC4,NFUNC3,NFUNC2,NFUNC1/
STRING NFUNC (A2)
DO IF       (JBYR LE 78)
RECODE      SUBF('MT'EQ'M')('ST'EQ'S')('RI'EQ'R')('RX'EQ'R')
               ('RS'EQ'R')(ELSE EQ COPY) INTO  NFUNC
END IF
DO IF           (JBYR GT 78)
RECODE FUNC ('P'='A') INTO NFUNC
END IF
END REPEAT
COMPUTE      NFUNC77=0
COMPUTE      NFUNC80=0
COMPUTE      NFUNC82=0
DO REPEAT    NFUNCX=NFUNC15,NFUNC14,NFUNC13,NFUNC12,NFUNC11,
                    NFUNC10,NFUNC9, NFUNC8, NFUNC7, NFUNC6,
                    NFUNC5, NFUNC4, NFUNC3, NFUNC2/
             FUNCL= NFUNC16,NFUNC15,NFUNC14,NFUNC13,NFUNC12,
                    NFUNC11,NFUNC10,NFUNC9, NFUNC8, NFUNC7,
                    NFUNC6, NFUNC5, NFUNC4, NFUNC3/
          JOBYR=  JBYR15, JBYR14, JBYR13, JBYR12, JBYR11,
                  JBYR10, JBYR9,  JBYR8,  JBYR7,  JBYR6,
                  JBYR5,  JBYR4,  JBYR3,  JBYR2/
IF  (NFUNCX NE FUNCL AND JOBYR LE 77) NFUNC77=NFUNC77+1
IF  (NFUNCX NE FUNCL AND (JOBYR GT 77 AND JOBYR LE 80))
    NFUNC80=NFUNC80+1
```

```
IF  (NFUNCX NE FUNCL AND JOBYR GT 80) NFUNC82=NFUNC82+1
END REPEAT
COMPUTE        NSITE77=0
COMPUTE        NSITE80=0
COMPUTE        NSITE82=0
DO REPEAT      SITE=SITE10,SITE9,SITE8,SITE7,SITE6,
                    SITE5,SITE4,SITE3,SITE2/
               SITEL=SITE11,SITE10,SITE9,SITE8,SITE7,SITE6,
                     SITE5,SITE4,SITE3/
               SITEYR=SITEYR10,SITEYR9,SITEYR8,SITEYR7,
                    SITEYR6,SITEYR5,SITEYR4,SITEYR3,SITEYR2/
IF  (SITE NE SITEL AND SITEYR LE 77) NSITE77=NSITE77+1
IF (SITE NE SITEL AND(SITEYR GT 77 AND SITEYR LE 80))
                   NSITE80=NSITE80+1
IF (SITE NE SITEL AND SITEYR GT 80) NSITE82=NSITE82+1
END REPEAT
COMPUTE             N77=0
COMPUTE             N80=0
COMPUTE             N82=0
COMPUTE            PR77=0
COMPUTE            PR80=0
COMPUTE            PR82=0
COMPUTE       HIRE76=0
IF (HYR=76)   HIRE76=1
COMPUTE       DSAL1=SAL81-SAL78
COMPUTE       DSAL2=CURRSAL-SAL81
COMPUTE MDPT77=0
IF (NDPT77 GE 1) MDPT77=1
COMPUTE MDPT80=0
IF (NDPT80 GE 1) MDPT80=1
COMPUTE MDPT82=0
IF (NDPT82 GE 1) MDPT82=1
COMPUTE MFUNC77=0
IF (NFUNC77 GE 1) MFUNC77=1
COMPUTE MFUNC80=0
IF (NFUNC80 GE 1) MFUNC80=1
COMPUTE MFUNC82=0
IF (NFUNC82 GE 1) MFUNC82=1
COMPUTE MDIV77=0
IF (NDIV77 GE 1) MDIV77=1
COMPUTE MDIV80=0
IF (NDIV80 GE 1) MDIV80=1
COMPUTE MDIV82=0
IF (NDIV82 GE 1) MDIV82=1
REGRESSION       DESCRIPTIVE /
                 VARIABLES=DSAL1,HIRE76,PRIOREXP,BACH,
                           MAST,TDEG,ENGR TO LAW,DEGAFTER,
                           SINGLE,NDPT77,NDPT80,NFUNC77,
                           NFUNC80,NDIV77,NDIV80    /
                 DEPENDENT =DSAL1                   /
                 ENTER
REGRESSION       DESCRIPTIVE /
```

```
                    VARIABLES=DSAL1,HIRE76,PRIOREXP,
                              BACH,MAST,TDEG,ENGR TO LAW,
                              DEGAFTER,SINGLE,
                              NDPT77,NDPT80,NFUNC77,NFUNC80,
                              NDIV77,NDIV80,AVPR80      /
                    DEPENDENT =DSAL1                    /
                    ENTER
REGRESSION          DESCRIPTIVE /
                    VARIABLES=DSAL1,HIRE76,PRIOREXP,BACH,
                              MAST,TDEG,ENGR TO LAW,DEGAFTER,
                              SINGLE,MDPT77,MDPT80,MFUNC77,
                              MFUNC80,MDIV77,MDIV80     /
                    DEPENDENT =DSAL1                    /
                    ENTER
REGRESSION          DESCRIPTIVE /
                    VARIABLES=DSAL1,HIRE76,PRIOREXP,BACH,
                              MAST,TDEG,ENGR TO LAW,DEGAFTER,
                              SINGLE,MDPT77,MDPT80,MFUNC77,
                              MFUNC80,MDIV77,MDIV80,AVPR80 /
                    DEPENDENT =DSAL1                    /
                    ENTER
REGRESSION          DESCRIPTIVE /
                    VARIABLES=DSAL2,HIRE76,PRIOREXP,BACH,MAST,
                              TDEG,ENGR TO LAW,DEGAFTER,
                              SINGLE,NDPT77,NDPT80,NDPT82,
                              NFUNC77,NFUNC80,NFUNC82,NDIV77,
                              NDIV80,NDIV82             /
                    DEPENDENT = DSAL2                   /
                    ENTER
REGRESSION          DESCRIPTIVE /
                    VARIABLES=DSAL2,HIRE76,PRIOREXP,BACH,
                              MAST,TDEG,ENGR TO LAW,DEGAFTER,
                              SINGLE,NDPT77,NDPT80,NDPT82,
                              NFUNC77,NFUNC80,NFUNC82,NDIV77,
                              NDIV80,NDIV82,AVPR80      /
DEPENDENT     =     DSAL2                               /
                    ENTER
REGRESSION          DESCRIPTIVE /
                    VARIABLES=DSAL2,HIRE76,PRIOREXP,BACH,
                              MAST,TDEG,ENGR TO LAW,DEGAFTER,
                              SINGLE,MDPT77,MDPT80,MDPT82,
                              MFUNC77,MFUNC80,MFUNC82,MDIV77,
                              MDIV80,MDIV82             /
                    DEPENDENT = DSAL2                   /
                    ENTER
REGRESSION          DESCRIPTIVE /
                    VARIABLES=DSAL2,HIRE76,PRIOREXP,BACH,MAST,
                             TDEG,ENGR TO LAW,DEGAFTER,SINGLE,
                             MDPT77,MDPT80,MDPT82,MFUNC77,
                             MFUNC80,MFUNC82,MDIV77,MDIV80,
                             MDIV82,AVPR80              /
                    DEPENDENT = DSAL2                   /
```

```
                ENTER
COMPUTE       LSAL1=LN(DSAL1)
COMPUTE       LSAL2=LN(DSAL2)
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL1,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,NDPT77,NDPT80,NFUNC77,
                          NFUNC80,NDIV77,NDIV80       /
                DEPENDENT =LSAL1                      /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL1,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,NDPT77,NDPT80,NFUNC77,
                          NFUNC80,NDIV77,NDIV80,AVPR80 /
                DEPENDENT =LSAL1                      /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL1,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,MDPT77,MDPT80,MFUNC77,
                          MFUNC80,MDIV77,MDIV80     /
                DEPENDENT =LSAL1                      /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL1,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,MDPT77,MDPT80,MFUNC77,
                          MFUNC80,MDIV77,MDIV80,AVPR80 /
                DEPENDENT =LSAL1                      /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL2,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,NDPT77,NDPT80,NDPT82,
                          NFUNC77,NFUNC80,NFUNC82,NDIV77,
                          NDIV80,NDIV82               /
                DEPENDENT = LSAL2                     /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL2,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,NDPT77,NDPT80,NDPT82,
                          NFUNC77,NFUNC80,NFUNC82,NDIV77,
                          NDIV80,NDIV82,AVPR80      /
                DEPENDENT = LSAL2                     /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL2,HIRE76,PRIOREXP,BACH,
                          MAST,TDEG,ENGR TO LAW,DEGAFTER,
                          SINGLE,MDPT77,MDPT80,MDPT82,
                          MFUNC77,MFUNC80,MFUNC82,MDIV77,
```

```
                    MDIV80,MDIV82                /
                DEPENDENT = LSAL2                /
                ENTER
REGRESSION      DESCRIPTIVE /
                VARIABLES=LSAL2,HIRE76,PRIOREXP,BACH,
                    MAST,TDEG,ENGR TO LAW,DEGAFTER,
                    SINGLE,MDPT77,MDPT80,MDPT82,
                    MFUNC77,MFUNC80,MFUNC82,MDIV77,
                    MDIV80,MDIV82,AVPR80     /
                DEPENDENT = LSAL2                /
                ENTER
BREAKDOWN TABLES=DSAL1,DSAL2 BY NDPT77,NDPT80,NDPT82,NDIV77,
                NDIV80,NDIV82,NFUNC77,NFUNC80,NFUNC82
BREAKDOWN TABLES=DSAL1,DSAL2 BY MDPT77,MDPT80,MDPT82,MDIV77,
                MDIV80,MDIV82,MFUNC77,MFUNC80,MFUNC82

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//
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